

Application No.: 10/620753  
Amendment dated: May 27, 2005  
Reply to Office action of March 8, 2005

AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application.

LISTING OF CLAIMS:

- 1 (currently amended). A tensioner comprising:
  - a housing having a front end, and a plunger-receiving hole, ~~said hole having a front end, formed in said housing, said hole having~~ an opening at said front end of the housing, and said hole having a plunger-receiving part having a first diameter spaced from said front end of the housing, and a widened part adjacent said front end of the housing, said widened part having a diameter wider than said first diameter and a shoulder recessed from said front end and facing toward said front end;
  - a plunger having a longitudinal axis and slidably fitting into said plunger-receiving hole and protruding axially from the opening thereof in a protruding direction, said plunger having an external surface with longitudinally extending, toothed racks formed thereon;
  - a protrusion biasing spring, biasing said plunger in said protruding direction;
  - a cam-receiving ring, through which the plunger extends, the cam-receiving ring being located in said widened part of the hole, and having an oblique cam-guiding surface, said guiding surface sloping in the direction of protrusion of the plunger and outward from the axis of the plunger;

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a ring-biasing spring, biasing said cam-receiving ring in the direction of protrusion of the plunger;  
a plurality of wedge-shaped cams, which slide on the oblique cam-guiding surface of the cam-receiving ring, and engageable with the racks on said plunger;  
a cam-biasing spring, biasing said wedge-shaped cams in the direction opposite to said direction of protrusion of the plunger; and  
a seal cap on said housing, the seal cap having a cap opening through which the plunger extends axially, and cooperating with said widened portion of said hole to provide an enclosure containing said ring-biasing spring, said cam-receiving ring, said wedge-shaped cams, and said cam biasing spring, said seal cap having an inside end surface surrounding said cap opening;  
wherein said cam-receiving ring is disposed between said inside end surface of said seal cap and said shoulder, and movable axially therebetween.

2(original). A chain tensioner according to claim 1, in which when the minimum backlash distance of said plunger is defined as  $M$ , the maximum backlash distance of said plunger is defined as  $N$ , the maximum displacement of said cam-receiving ring is defined as  $S$ , the return distance of the plunger due to displacement of said cams from a position immediately preceding the position at which said cams step over one tooth of the racks is defined as  $n$ , and the return distance of the plunger due to displacement of said cams from a position immediate following the position at which said cams step over one tooth of the racks is defined as  $m$ , the dimensions of the

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racks of the plunger, the wedge-shaped cams, and the cam-receiving ring satisfy the relationships  $M = m + S$  and  $N = n + S$ .